A Social Network with user verification through a 3 way Turing test similar approval

Nipun Aggarwal

October 7, 2019

Abstract

A huge portion of the fake-news and rumors that exist on the internet are generated, regulated and propagated by non-human robots. Recent endeavors in the field of Deep Learning have seen an increasing number of Images, Videos and Language contents that may be polarised and offensive, but their origins are fuzzy. This has been seen to affect a number of public events including processions and also affecting public opinion in cases of voting and ballots

Key words: Rumor, Information Diffusion, Turing Test, Automated Bots, Non-repudiation, AIMD, Social Networks

CONTENTS

1 A MODIFIED TURING TEST

Nipun Aggarwal

1.1 GROWING NON-HUMAN FAKE INFORMATION SOURCES

There are a lot of social bots generating information on social media ref(Varol, Onur; Emilio Ferrara; Clayton A. Davis; Filippo Menczer; Alessandro Flammini (2017). "Online Human-Bot Interactions: Detection, Estimation, and Characterization". Proc. International AAAI Conf. on Web and Social Media (ICWSM)). Considering the growing number of users on social networks and the inability to differentiate between real and fake news due to negative use of advanced Natural language Processing(ref: Robert Faris, Hal Roberts, Bruce Etling, Nikki Bourassa, Ethan Zuckerman, and Yochai Benkler.Partisanship, propaganda, and disinformation: Online media and the 2016 us presidential election.Berkman Klein Center Research Publication 2017-6., 2017.). It becomes increasingly important to consider how rumors may actually be forming opinions ref(Warren A. Peterson and Noel P. Gist, "Rumor and Public Opinion," American Journal of Sociology 57, no. 2 (Sep., 1951): 159-167.)

It becomes increasingly important to attach a credibility to each of the person. If we wonder, we can easily get to the conclusion that one of the most dependable tests regarding differentiation between a Natural language Processing Bot and a human is the Turing Test(ref: A. M. Turing (1950) Computing Machinery and Intelligence. Mind 49: 433-460.). Although other recent methods such as Audio and Image Captcha(von Ahn L., Blum M., Hopper N.J., Langford J. (2003) CAPTCHA: Using Hard AI Problems for Security. In: Biham E. (eds) Advances in Cryptology — EUROCRYPT 2003. EUROCRYPT 2003. Lecture Notes in Computer Science, vol 2656. Springer, Berlin, Heidelberg), however multiple instances of Captchas being broken in recent times have been reported as recently as 2019(Jing Wang, Jiaohua Qin, Xuyu Xiang, Yun Tan, Nan Pan. CAPTCHA recognition based on deep convolutional neural network. Mathematical Biosciences and Engineering, 2019, 16(5): 5851-5861. doi: 10.3934/mbe.2019292)

1.2 DOING THE TURING TEST

1.2.1 THE IDEAL CASE

The ideal case in a Turing test is when there are Three separate rooms with a device of communication and there is no way to distinguish on the basis of the devices the identity of any participant. The ideal case assumes that all three of the participants are in the following roles, A human judge and two separate entities of which one is definitely a human and the other is a machine.

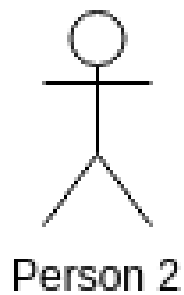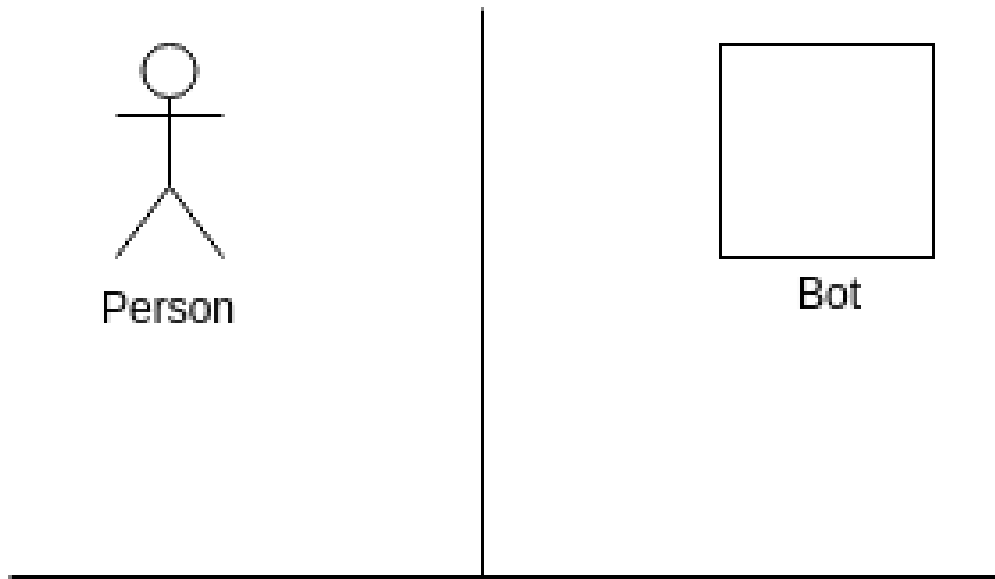There is thus only one dilemma, which one is the robot.

Figure 1.1: The Ideal Turing test

1.2.2 AN ANONYMOUS CASE: A NOVEL PROPOSAL

Diverting from the ideal case, I present a modified Turing test that has a factor of multiple ambiguities. The entities are now a human judge and a human entity and an unknown entity, either a human or a machine and the judge has to make the following decisions:
Which entity is a definite human?
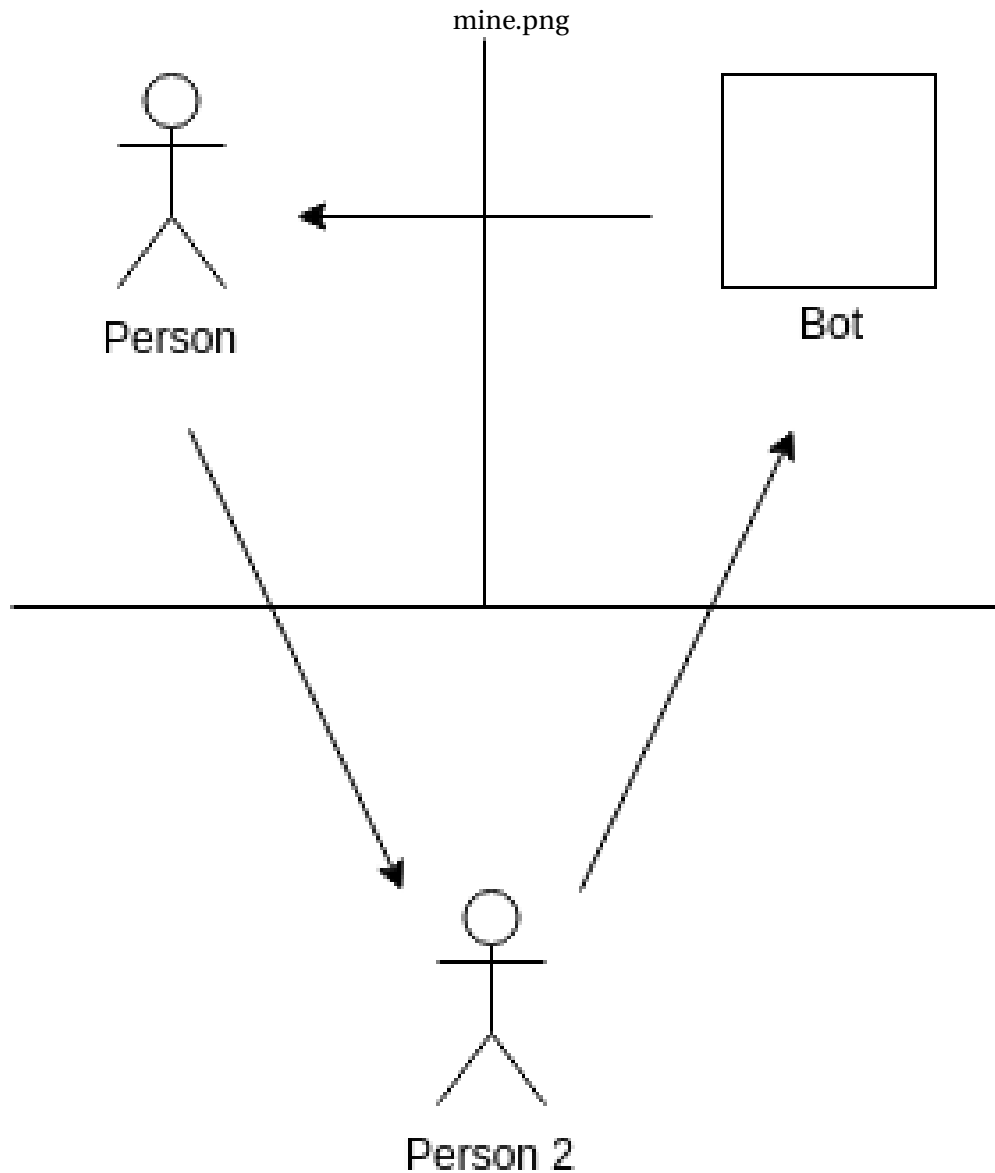Whether the other entity is a machine or a human?

mine.png

Figure 1.2: 3 way turing

One way of making sure that this test succeeds is the Three way Turing tests. If we can be sure that 2 of the entities are humans, a 3 way Turing test in which each of the entities gets to behave as a judge has very high chances of coming up with the right results.

1.2.4 NON IDEAL CASE: WHEN THE JUDGE IS A MACHINE

When the judge is a machine, it is very similar to the case of inverted turing test (ref: Ahn, L. V.; Blum, M.; Hopper, N.; and Langford, J. 2003. Captcha: Using hard AI problems for security. In Proceedings of the 22Nd International Conference on Theory and Applications of Cryptographic Techniques, EUROCRYPT'03, 294–311. Berlin, Heidelberg: Springer-Verlag.). I claim that humans have a high bias towards selecting other humans and machines will have a high bias towards selecting other machines.

1.3 SUMMARY

We can conclude that it is ideal to conduct a 3 way Turing test in which two participating entities are definite humans to discern the identity of an unknown user that wishes to be added to the network. The users will have to verify their own selves and also the incoming user. Turing test is therefore, made even more difficult, an impostor not only has to answer a question but also ask questions that are in natural language, making the spoofing difficult.